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CONSUMER ACCEPTANCE OF A NEW BACON SUBSTITUTE

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ABSTRACT

A new striplike bacon analog was market tested successfully in Fort Wayne, Ind., from September 1968 through February 1969. The product was introduced with a substantial promotional campaign that emphasized the analog's uniqueness related to health and economy. Sales data from store audits indicate a fairly favorable response by consumers. Ratio of sales, bacon/bacon analog, was 24 to 1 in phase I (heavy promotion period) and 79 to 1 in phase II (little or no promotion). The test product attained a market share of 4 percent initially, which declined to 1.3 at the end of the test period. A fairly strong promotional campaign and some measure of control over display and store stocks will be necessary if a high level of sales is to be maintained. The consumer survey revealed little aversion to a vegetable protein bacon substitute. It also revealed no appreciable substitution effect on bacon sales in the short run.

Key words: Bacon analog, market test, vegetable protein, and bacon.

PREFACE

In September 1968, a small food manufacturer specializing in meat-substitute products introduced in the Fort Wayne, Ind., market a bacon substitute made from vegetable protein materials. Before and during the market test, the U.S. Department of Agriculture (USDA) had, at the request of this firm, provided informal consultation on proper research methods to use in readying a product for commercial introduction. The Department has had considerable product- and market-testing experience because of product development activities of its utilization laboratories. In return for its help, USDA was given, for the purpose of information and publication if desired, the nonproprietary information collected during the test period. Publication was deemed desirable since it will allow the entire food industry to more realistically appraise the potential of meat analogs. This, in turn, should give decisionmakers in both the public and private sectors a better understanding of the impact of these new food forms.

Use of data from this market test does not in any way constitute endorsement of the product or process by the Department or imply discrimination against other similar products or processes.

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SUMMARY

A new striplike bacon analog was successfully market tested in Fort Wayne, Ind., for 6 months, beginning in September 1968. Most of the users or buyers found the product acceptable, although they continued to use bacon. This lack of substitution is, of course, a shortrun effect. Food habits do not change easily and, therefore, it is possible, in the long run, that continued purchases of a bacon analog may have a substitution effect on household consumption.

Sales of bacon compared with those of the analog showed a ratio in phase I (first half of the test period) of 24 to 1 and in phase II (second half of the test period) of 79 to 1. The analog attained a 4-percent share of the bacon market during the period of heaviest promotion (phase I). By the end of the test period, the analog's share had declined to 1.3 percent. Apparently, to attain a high level of sales, a store or a food manufacturer will have to maintain a strong promotional campaign.

During the first half of the test period, the fairly substantial promotional campaign emphasized the analog's uniqueness in terms of health and economy. Advertisements stated that it has little or no cholesterol; one-third the calories of bacon; and on an as-served basis, costs half as much as bacon. The second half of the test period involved little or no promotion or display control, since neither would normally be expected in a product already established commercially. This difference in treatment between the two periods provided a basis for evaluating the effectiveness of the advertising campaign.

The market test was conducted by a private market research company under contract with the food manufacturer of the analog. Store audits were used to determine sales and likely competitors, while consumer surveys were made to ascertain reactions, problems in use, and initial and repeat purchase rates.

The product was placed in 40 supermarkets in national, regional, and local chains in the Fort Wayne area. An unusual feature was that the analog was sold as a frozen food, whereas bacon stocks were displayed as usual in refrigerated cases in a separate section of each store. In addition, the price of the analog was held constant throughout the test period.

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INTRODUCTION

Fabricated foods compete with traditional agricultural commodities for a share of the consumer's food dollar. These new products are generally manufactured from components of traditional agricultural commodities and nonagricultural products. Their potential effect on agricultural commodity markets is of considerable interest to all segments of the farm economy, including researchers and policymakers in the U.S. Department of Agriculture.

In recent years, a number of firms, both large and small, have been developing the capability of producing and marketing various kinds of meat analogs. Some of the products are being used as ingredients in dried entrees for the household market. Others are being developed as separate entities, such as bacon analog bits; while others are being used in the institutional market as meat substitutes in various kinds of main-dish entrees. A number of articles have been written on the development of vegetable protein materials as meat substitutes, but little information has been published evaluating the sales performance of a meat analog in an actual market test situation. This publication provides the general public and policymakers with the first realistic evaluation of the sales potential of a meat analog in the household market sector.

OBJECTIVES OF MARKET TEST

Objectives of the market test were: (1) To determine the new product's sales potential, (2) to compare the product's sales with those of bacon, (3) to evaluate the relationships between store characteristics and sales of the new product, and (4) to assess the product's market prospects.

DESCRIPTION OF THE ANALOG

The test product simulates the form, texture, color, and taste of bacon and can be used as bacon by homemakers. Approximately 14 ingredients are contained in the product:

Wheat proteins	Salt
Soy proteins	U.S. certified color
Yeast proteins	Seasonings
Water	Monosodium glutamate
Corn oil	Vegetable gum
Egg albumen	Flavorings
Brown sugar	Nucleotides

The manufacturer's analysis of the approximate yield of nutrients from four strips (28.4 grams) of the test product is shown below:

Component	Amount
	<u>Grams</u>
Protein	6.30
Fat	3.10
Carbohydrate	3.30
Ash	1.40
Fiber	0.30
Moisture	14.36
	<u>Milligrams</u>
Sodium	483.00
Calcium	2.80
Iron	0.45

Source: Manufacturer's New Bacon Analog Recipes.

The major differences between the analog and bacon were stressed in advertisements to consumers. The analog is precooked and does not shrink during cooking. It contains little or no cholesterol, and has only one-third the calories of bacon (65 per four strips of the analog). In addition, throughout the test period, the price of the analog was held constant at 69 cents for an 8-ounce package. Newspaper advertisements stressed that the 8-ounce package contained 32 slices in contrast to the 20 slices usually found in a 1-pound package of bacon. On an as-served basis, therefore, the analog cost approximately half as much as bacon.

Another unusual feature was that the bacon analog was sold as a frozen food whereas bacon stocks were displayed as usual in refrigerated cases in a separate section of each store.

MARKET ENVIRONMENT AND METHODOLOGY

The analog was market tested in Fort Wayne, Ind., from September 1968 through February 1969. Fort Wayne is located in the northeastern part of the State and has a diversified industrial economy. The city's 1968 population was estimated to be 176,000, compared with a 1960 population of 161,800.

Forty supermarkets in national, regional, and local chains were selected for the test. For analytical purposes, test stores were classified on the basis of seven major characteristics. Three of these--average weekly dollar sales, neighborhood median income, and type of store--remained the same throughout the 6-month test. These store characteristics are generally stable over short time periods. The remaining characteristics--meat case dollar sales, pounds of bacon sold, average price of bacon, and number of bacon brands available--were not the same throughout the test period. These store characteristics usually change fairly rapidly. Since the number of stores in each class was not constant during the entire test period, the analysis was based on average sales of the analog and of bacon per store as indicators of possible market relationships.

Each store's sales were audited monthly by the private market research company under contract with the manufacturer of the analog. The primary data consisted of the sales of the bacon analog; bacon; imitation-bacon bits; and selected meat case items, such as TV dinners, meat pies, and seafood packs. Data on the amount sold, number of brands available, and price per unit were recorded. Throughout the 6-month test, no control was exercised over factors influencing store sales of products other than the test product.

The test period was divided into two phases. During phase I (the first 3 months), in-store displays and stocks of the analog were checked and maintained each week by contract personnel. Intensive promotion and advertisement of the analog consisted of in-store shelf talkers, weekly quarter-page newspaper advertisements, and frequent TV spot advertisements. During phase II (the second 3 months), food brokerage and store personnel maintained in-store displays and stock. There were few newspaper, TV, and radio advertisements. Marketing of the bacon analog was similar to that for a long-established product; that is, considerably fewer inputs of promotion and merchandising.

In addition to making the store audits, the contractor interviewed buyers and nonbuyers of the analog by telephone. During the initial weeks of the study, about 500 cards were placed in the new product packages offering purchasers a small gift for filling out their name and address and mailing the card. About 300 cards were returned, and these people were interviewed to determine their reaction to the analog. A sample of 100 people who were aware of the analog but had not tried it was selected from the Fort Wayne telephone directory, and these people were interviewed. Information obtained included initial purchase rate, repeat purchase rate, intentions to buy, problems in use, reaction to price level, household use patterns, and overall satisfaction with the product. Because of the proprietary nature of the consumer data, specific tables relating to percentage-buying, problems in use, and so on, are not shown.

MARKET TEST RESULTS

Several important market relationships emerged: (1) The new bacon analog is an acceptable product; (2) the product's sales pattern is similar to that of bacon; (3) store characteristics can be used as guidelines for introducing the product in other markets and in stores within a market; (4) promotion and some measure of control over display and store stocks are necessary to maintain a high level of analog sales; (5) in the short run, the analog does not compete with bacon; and (6) market share is only a partial indicator of potential sales of the analog.

Consumer Acceptance of the Analog

In 38 test stores, the analog was purchased each month throughout the test period. In two stores, it was purchased in each of 5 months. This consistent purchasing pattern, as indicated by store audits, suggests that the bacon analog is an acceptable product.

A further indication of acceptance by Fort Wayne buyers was provided by the consumer survey results. Users were asked to rate their overall satisfaction with the analog on a five-point scale. They were also asked to discuss what they specifically liked and disliked about the product. In general, users expressed a high level of satisfaction. The product's strongest attributes were ease and speed of preparation and good cooking qualities. A large proportion of the users found nothing that they disliked about the product.

A substantial majority of analog users said they would buy the product again. Buyers' initial and repeat purchase rates as determined by the consumer survey phase reinforce the pattern noted in the audited sales data.

Sales Pattern of the Analog and Bacon

Average monthly sales of the bacon analog and bacon during phase I, phase II, and the entire test period are compared in table 1.

Table 1.--Average monthly sales of the analog and bacon, by phase, test area,
September 1968-February 1969

Product	Phase I	Phase II	Both phases
Bacon analog	3,051	846	1,948
Bacon	73,772	66,932	70,352
Ratio of bacon to analog	24	79	36

Sales of the analog and bacon declined from phase I to phase II but not by the same relative or absolute magnitudes. Bacon analog sales declined 72 percent, whereas bacon sales declined only 9 percent. In addition, analog sales declined in each store, while bacon sales increased in 15 stores and decreased in 25 stores. The decline in analog sales during phase II was associated with little or no promotion, little display case control, and distribution in the hands of a food broker. Store personnel said the slight decline in bacon sales was due to seasonal and other factors rather than to the availability of the bacon analog.

One measure of the market potential of a new product is its sales compared with those of a similar product. Total poundage of bacon consumed nationally in 1968 was estimated to be 1.45 billion pounds. 1/ Since the test product closely simulates bacon, the ratio of bacon sales to analog sales provides a rough estimate of the new product's potential in the market place (table 1). Although it is extremely hazardous to make projections based on the results of one market test, these data do indicate the tremendous market that may be available to successful bacon analogs.

Relation of Sales of the Analog and Bacon to Store Characteristics

Sales of the bacon analog and bacon were not the same for all stores in the test market. Several significant relationships emerged when sales were related to specific store characteristics (table 2).

Neighborhood Income.--Bacon analog and bacon sales were greater when the median income for the neighborhood was above \$6,000. Also, for each income level, sales of both products were larger in those stores with the highest total sales and meat case sales.

Type of Store.--The average sale of the bacon analog per store was greater in local and regional chains than in national chains. In contrast, the average sale of bacon per store was greater in one of the national chains than in the regional and local chains, and next highest in the local chains.

Weekly Dollar Sales.--Bacon analog and bacon sales were significantly greater in stores having high average weekly sales than in other stores. However, the ratio of sales of bacon to sales of the analog was also greater in these stores than in others. This result suggests that sales of the two product types respond differently to increases in weekly store sales. These patterns were consistent for phases I and II despite the absolute decline in both products' sales in phase II.

Monthly Meat Case Sales.--Bacon analog and bacon sales increased as other meat case sales increased.

1/ Federal meat inspection statistics and Household Food Consumption Survey--1965-66, Report No. 1, Agr. Res. Serv., U.S. Dept. Agr.

Table 2.--Average pounds of bacon and the analog sold per store, by selected store characteristics, test area, September 1968-February 1969

Store characteristics	Phase I		Phase II		Average, both phases	
	Bacon	Analog	Bacon	Analog	Bacon	Analog
	----- Pounds -----					
Neighborhood median income:						
\$6,000 or less.....	1,524	56	1,295	17	1,409	37
More than \$6,000.....	2,217	99	2,022	25	2,120	62
Type of chain:						
National.....	2,429	74	2,075	21	2,252	47
National.....	821	58	1,013	13	917	35
Local.....	2,160	84	1,729	27	1,944	55
Local.....	2,171	91	2,126	25	2,149	58
Regional.....	1,344	58	1,171	16	1,257	37
Average weekly sales:						
\$39,999 or less.....	1,160	53	1,044	15	1,102	34
\$40,000-\$59,999.....	2,124	80	1,915	24	2,020	52
More than \$60,000.....	3,061	123	2,776	33	2,919	78
Other meat case sales:						
\$100 or less.....	672	38	757	10	714	24
\$101-\$200.....	1,869	68	1,597	19	1,733	44
Greater than \$200.....	2,561	105	2,271	29	2,416	67
Bacon sales (pounds):						
1,000 or less.....	1,829	30	421	7	1,125	18
1,001-2,000.....	1,444	66	1,429	19	1,436	40
2,001-3,000.....	2,445	95	2,425	30	2,435	63
More than 3,000.....	3,501	132	3,435	38	3,468	85
Average price/lb. bacon:						
75¢ or less.....	1,829	69	1,662	20	1,745	44
76¢-80¢.....	1,842	71	1,650	19	1,746	45
81¢-85¢.....	2,029	89	1,664	22	1,846	56
More than 85¢.....	1,552	73	1,535	21	1,543	47
Brands of bacon available:						
5 or less.....	1,397	55	991	13	1,194	34
More than 5.....	1,989	83	1,932	24	1,960	54

Bacon Sales.--Sales of the analog per store increased as sales of bacon increased. To a limited degree, this correlation indicates that the bacon analog is considered a new product, and possibly a complementary product, by consumers who limit bacon purchases for health or other reasons.

Price of Bacon.--Both products showed little variation among stores when stores were grouped by average price of bacon per pound. The highest sales of the bacon analog and bacon occurred in stores in which the price of bacon ranged from 81 to 85 cents in both phase I and phase II.

The effect of the price of bacon on sales of the analog in individual stores could not be evaluated. The price of the bacon analog was constant, whereas the price of bacon varied because of the different brands within a store and from store to store. The price of bacon was only one of a number of marketing factors that might have influenced per store sales of the analog. Also, since the two products were not sold side by side in the stores, the influence of price differentials between them was somewhat reduced.

The consumer survey indicated that the analog's price was an important consideration for buyers. An overwhelming majority of buyers of the bacon analog regarded the price as very reasonable. Since one of the important elements of the advertising campaign was to stress how economical the bacon analog was compared with bacon, it was not very surprising to find this favorable attitude.

Brands of Bacon Available.--Average per store sales of both products were larger when more than five brands of bacon were available. However, use of the number of brands of bacon as a criterion for introduction of the analog would probably be invalid. Other store characteristics, such as average total weekly sales, neighborhood median income, and meat case sales, would be better criteria to use in selecting stores for introduction of a bacon analog. These criteria are more stable than the number of brands of bacon available and are generally more easily obtained.

Promotion and Display Control

The test procedure did not permit identifying the effects of controlling promotion and display on per store sales of the analog. However, a comparison of the bacon analog's sales performance in phase I and phase II suggests that sales are influenced considerably by promotion and in-store inventory and display control. The average monthly sales of the analog declined by 72 percent from phase I to phase II. Similar declines in its sales occurred for each store in the test market.

Competition Between the Analog and Bacon

The market test results did not clearly delineate the competitive relationships between the bacon analog and bacon. They did indicate:
(1) Sales volume patterns of the bacon analog and bacon were similar;

(2) average price per pound of bacon did not appreciably influence the analog's sales during the test period; (3) for each selected store characteristic, changes in sales of the bacon analog and bacon were not of the same magnitude; and (4) percentage declines in bacon sales from phase I to phase II were less than those noted for the bacon analog.

The consumer survey indicated a greater amount of competition between the bacon analog and bacon than did the store audit data. This is reflected in the way the analog was used in the home. Most users said they used the product at breakfast, generally as the main meat course. Survey findings also indicated that many users were attracted to the analog because of its advertised low-caloric and low-cholesterol values. Probably many of those who bought the product for these reasons were not then using bacon or were not serving it to certain individuals in their families. At present, the substitution effect of the bacon analog on bacon consumption is not clear. However, it is unlikely that one-for-one consumption of analog for bacon will prevail in the long run. The bacon analog may find a large share of its customers among people who are not now using bacon for dieting or health reasons. However, if the favorable price-use relationships prevailing in the market test continue during a regional or national introduction of the product, the analog is likely to acquire a share of the bacon market similar to that established in the market test.

Share of Market for the Analog and Bacon

The market shares of the bacon analog and bacon are presented in table 3. The analog's share declined from 4 percent in phase I to 1.3 percent in phase II. This decline is probably attributable to changes in the method of distribution and promotion.

Table 3.--Market share of the analog and bacon by selected retail store bacon sales groups, test area, September 1968-February 1969

Average monthly sales of bacon in retail stores (in pounds)	Phase I		Phase II		Both phases	
	Analog	Bacon	Analog	Bacon	Analog	Bacon
	Percent					
0-499.....	6.1	93.9	2.1	97.9	4.1	95.9
500-999.....	6.0	94.0	1.2	98.8	3.7	96.3
1,000-1,499.....	4.9	95.1	1.5	98.5	3.0	97.0
1,500-1,999.....	3.9	96.1	1.1	98.9	2.5	97.5
2,000-2,499.....	3.4	96.6	1.3	98.7	2.4	97.6
2,500-2,999.....	3.8	96.2	1.1	98.9	2.4	97.6
3,000-3,499.....	3.8	96.2	1.1	98.9	2.8	97.2
3,500-3,999.....	3.5	96.5	1.0	99.0	2.9	97.1
4,000-4,499.....	4.0	96.0	1.5	98.5	3.2	96.8
4,500-4,999.....	4.1	95.9	---	---	4.1	95.9
All stores.....	4.0	96.0	1.3	98.7	2.7	97.3

In phase I, the analog's market share was highest in stores that sold an average of 0-499, 500-999, and 1,000-1,499 pounds of bacon per month, and in phase II, 0-499, 1,000-1,499, and 4,000-4,499 pounds per month. If maximization of market shares were the only criterion for store outlet selection, these stores would be expected to perform best as outlets for a bacon analog. However, a more appropriate criterion of store selection for maximum market penetration is the average sales per store by various bacon sales groupings (table 4). Based on this criterion, stores with bacon sales above 2,000 pounds per month would be selected for the introduction of the analog.

Table 4.--Average sales of the analog and bacon per store, by selected bacon sales groupings, test area, September 1968-February 1969

Bacon sales groups (pounds)	Phase I			Phase II			Both phases		
	Stores	:		Stores	:		Stores	:	
	within	:		within	:		within	:	
	bacon	:	Analog:Bacon:	bacon	:	Analog:Bacon:	bacon	:	Analog:Bacon
	sales	:		sales	:		sales	:	
	group	:		group	:		group	:	
	Number	--Pounds--		Number	--Pounds--		Number	--Pounds--	
0-499.....	17	18	282	18	6	281	35	12	282
500-999.....	8	53	796	6	11	893	14	32	884
1,000-1,499..	25	65	1,267	33	19	1,228	58	42	1,248
1,500-1,999..	17	68	706	19	19	1,720	36	44	1,713
2,000-2,499..	22	79	2,266	20	31	2,222	42	55	2,244
2,500-2,999..	14	108	2,728	15	28	2,688	29	68	2,708
3,000-3,499..	9	129	2,885	6	38	3,282	15	84	3,084
3,500-3,999..	5	370	3,706	2	38	3,677	7	204	3,692
4,000-4,499..	2	177	4,200	1	62	4,021	3	120	4,111
4,500-4,999..	1	190	4,500	--	--	--	1	190	4,500

IMPLICATIONS

Analysis of the market test data implies that a relationship exists between retail store characteristics and the sales performance of bacon analogs.

Market test results indicate guidelines for placing bacon analogs in new markets and for choosing stores for promotion emphasis on this product from within a market area. For example, stores with the best sales performance for the bacon analog were those located in a neighborhood with median incomes above \$6,000, with weekly sales of \$40,000 or above, and with bacon sales of 2,000 to 2,499 pounds per month. The analysis also provides guidance for developing marketing strategies and distribution schemes to maintain or increase sales.

Hard estimates of the potential impact of fabricated foods, such as a bacon analog, on sales of traditional agricultural commodities could not be obtained from the limited data of this market test. No evidence during the 6-month test period indicated that the bacon analog sales had an appreciable

effect on sales of bacon. However, the high sales obtained in phase I--the period of heavy promotion--indicated that a segment of the public will accept a meat analog product if it is of good quality and is reasonably priced.

The consumer survey indicated a high level of satisfaction with the product and little or no adverse reaction to the concept of a meat analog. It also pointed up the versatility of this type of product in its appeal to important segments of the market--weight and cholesterol watchers and people interested in good buys.

Another interesting feature was the good reception the product received as a frozen food. Apparently, meat analogs may not suffer too severely in sales if sold from freezer cases rather than the traditional refrigerated meat cases. It is also significant that the test product is still being sold in Fort Wayne and in at least two other cities where the product was introduced in 1969-70. All in all, test market results, though limited, indicate a good chance for further commercial success of the bacon analog.

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